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 FACIL: STN-50-528 Palo Verde Nuclear Station, Unit 1, Arizona Publi 05000528
 AUTH. NAME AUTHOR AFFILIATION
 BRADISH, T.R. Arizona Public Service Co. (formerly Arizona Nuclear Power
 LEVINE, J.M. Arizona Public Service Co. (formerly Arizona Nuclear Power
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 91-011-00: on 911029, determined that design basis App R fire in control room could result in loss of one Train B essential air handling unit. Caused by failure of original App R design. Hourly fire watch established. W/911127 ltr.

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NOTES: STANDARDIZED PLANT

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EXTERNAL:	EG&G BRYCE, J.H		3	3	L ST LOBBY WARD		1	1
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Arizona Public Service Company

PALO VERDE NUCLEAR GENERATING STATION
P.O. BOX 52034 • PHOENIX, ARIZONA 85072-2034

JAMES M. LEVINE
VICE PRESIDENT
NUCLEAR PRODUCTION

192-00757-JML/TRB/WHD
November 27, 1991

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
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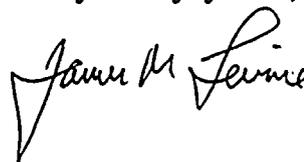
Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 1
Docket No. STN 50-528 (License No. NPF-41)
Licensee Event Report 91-011-00
File: 91-020-404

Attached please find Licensee Event Report (LER) 91-011-00 prepared and submitted pursuant to 10CFR50.73. In accordance with 10CFR50.73(d), we are forwarding a copy of the LER to the Regional Administrator of the Region V office.

If you have any questions, please contact Thomas R. Bradish, Compliance Manager, at (602) 393-2521.

Very truly yours,



JML/TRB/WHD/nk

Attachment

cc: W. F. Conway (all with attachment)
J. B. Martin
D. H. Coe
INPO Records Center

9112040081 911127
PDR ADOCK 05000528
3 PDR

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FACSIMILE

LICENSEE EVENT REPORT (LER)

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TITLE
Loss of Essential Air Handling Unit Due to Postulated Fire

EVENT DATE			LER NUMBER			REPORT DATE			OTHER FACILITIES INVOLVED											
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES		DOCKET NUMBER(S)									
1	0	2	9	9	1	9	1	0	1	1	0	0	1	1	2	7	9	1	Palo Verde Unit 2	0 5 0 0 0 5 2 9
																			Palo Verde Unit 3	0 5 0 0 0 5 3 0

OPERATING MODE 3	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following)									
POWER LEVEL 0 0 0	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.406(e)	<input type="checkbox"/> 80.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)						
	<input type="checkbox"/> 20.406(a)(1)(i)	<input type="checkbox"/> 80.36(e)(1)	<input type="checkbox"/> 80.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)						
	<input type="checkbox"/> 20.406(a)(1)(ii)	<input type="checkbox"/> 80.36(e)(2)	<input type="checkbox"/> 80.73(a)(2)(vi)	<input checked="" type="checkbox"/> OTHER (Specify in Abstract below and in Text) Technical Specification 6.9.3						
	<input type="checkbox"/> 20.406(a)(1)(iii)	<input type="checkbox"/> 80.73(a)(2)(i)	<input type="checkbox"/> 80.73(a)(2)(vii)(A)							
	<input type="checkbox"/> 20.406(a)(1)(iv)	<input type="checkbox"/> 80.73(a)(2)(ii)	<input type="checkbox"/> 80.73(a)(2)(vii)(B)							
<input type="checkbox"/> 20.406(a)(1)(v)	<input type="checkbox"/> 80.73(a)(2)(iii)	<input type="checkbox"/> 80.73(a)(2)(iii)	<input type="checkbox"/> 80.73(a)(2)(ix)							

LICENSEE CONTACT FOR THIS LER

NAME Thomas R. Bradish, Compliance Manager	TELEPHONE NUMBER 6 10 12 3 19 13 1 2 1 5 1 2 1
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED		EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines)

On October 29, 1991, Palo Verde Units 1 and 3 were in MODE 3 and Unit 2 was in Mode 6 at approximately 96 degrees Fahrenheit and depressurized to atmospheric pressure when APS engineering personnel determined that a design basis Appendix R fire in the Control Room could result in the loss of one Train "B" Essential Air Handling Unit (AHU). The Train "B" Essential AHU provides cooling to Train "B" Engineered Safety Features (ESF) equipment, Train "B" DC equipment, and Train "B" DC battery rooms. The Train "B" equipment is necessary for the safe shutdown of the plant if there was a fire in the Control Room. Upon discovery of this potential event, appropriate compensatory measures were established in accordance with the PVNGS Fire Protection Program.

The cause of this postulated event was a failure of the original Appendix R evaluation to recognize the control circuit for the Essential AHU being in the Control Room.

A previous similar event was reported pursuant to Technical Specification 6.9.3 in LER 528/91-008-01.

bcc: J. M. Levine 6125
J. N. Bailey 1966
W. E. Ide 7194
R. K. Flood 7294
R. J. Adney 7394
R. F. Schaller 7194
T. D. Shriver 7294
J. J. Scott 7394
F. W. Riedel 7198
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D. M. Eastman 6794
M. R. Oren (STA) 6073
T. E. Matlock (NSD) 6963
D. N. Stover 1922
J. R. LoCicero (ISEG) 6054
R. W. Page 1938
D. B. Andrews 6345
M. E. Powell 1515
A. C. Rogers 1966
R. G. Hogstrom 6086
D. A. Hettick 6996
A. C. Gehr 4141
A. H. Gutterman
P. J. Coffin 6148
B. A. Brown 6148
Responsible Department (required review):
D. F. Garchow 6073
G. R. Overbeck 6102
F. D. Garrett 6285
P. J. Caudill 6163
Compliance Supervisor
Compliance Manager



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I. DESCRIPTION OF WHAT OCCURRED:

A. Initial Conditions:

On October 29, 1991, Palo Verde Units 1 and 3 were in MODE 3 (HOT STANDBY) at approximately 564 degrees Fahrenheit and 2250 pounds per square-inch absolute and Unit 2 was in Mode 6 (REFUELING) at approximately 96 degrees and depressurized to atmospheric pressure.

B. Reportable Event Description (Including Dates and Approximate Times of Major Occurrences):

Event Classification: Violation of requirements of the Fire Protection Program which would have adversely affected the ability to achieve and maintain safe shutdown in the event of a fire. (Technical Specification 6.9.3)

On October 29, 1991, APS Engineering personnel (utility, non-licensed) determined that a design basis Appendix R fire in the Control Room (NA) could result in the loss of cooling to the Train "B" Engineered Safety Features (ESF)(JE) switchgear room, the DC Equipment Room (EJ)(NA) and the DC Battery Room (EJ)(NA) in the Control Building (NA) 100 foot elevation. This loss of cooling could result in the temperature in the Train "B" DC Equipment Room increasing to the point that the equipment required for safe shutdown could be rendered inoperable. Upon discovery of this potential event, interim compensatory measures were established in accordance with the PVNGS Fire Protection Program.

For a fire in the Control Room, PVNGS takes credit for the Train "B" safe shutdown equipment (JE) to safely shutdown the plant. The control circuits for one of two available Train "B" Essential Air Handling Units (AHU)(VI) are located in the Control Room. If there was a fire in the Control Room, it is assumed the circuits would be damaged. The damage could render one Essential AHU inoperable. As a result of this Essential AHU not operating, the Class 1E Train "B", channel "B" and "D" inverters (INVT)(EF), and the channel "B" and "D" battery chargers (BYC)(EJ) may become inoperable due to high temperature. If the temperature in the DC equipment room exceeds the maximum equipment qualification temperature the operation of the inverters and battery chargers cannot be assured.

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91	011	010

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C. Status of structures, systems, or components that were inoperable at the start of the event that contributed to the event:

Not applicable - no structures, systems, or components were inoperable at the start of the event which contributed to the event.

D. Cause of each component or system failure, if known:

Not applicable - no component or system failures were involved.

E. Failure mode, mechanism, and effect of each failed component, if known:

Not applicable - no component failures were involved.

F. For failures of components with multiple functions, list of systems or secondary functions that were also affected:

Not applicable - no component failures were involved.

G. For a failure that rendered a train of a safety system inoperable, estimated time elapsed from the discovery of the failure until the train was returned to service:

Not applicable - no failures were involved which rendered a train of a safety system inoperable.

H. Method of discovery of each component or system failure or procedural error:

Not applicable - there have been no component or system failures or procedural errors identified. However, as described in Section I.B. the event was discovered by APS Engineering Personnel while performing a full scope Appendix R Analysis Revalidation.

I. Cause of Event:

The cause of this postulated event was a failure of the original Appendix R evaluation to recognize the potential for a fire in the Control Room affecting the control circuits for one Essential AHU. Prior to licensing Unit 1 during mid-1984, Combustion Engineering, Bechtel, and APS evaluated and identified equipment necessary to safely shutdown the plant during postulated fires. Even though a comprehensive study of the safe shutdown circuits and equipment was performed, this circuit was left out. This is attributed to human error.



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(SALP Cause Code A: Personnel Error) No unusual characteristics of the work location (e.g., noise, heat, poor lighting) directly contributed to this event. The event was not a result of procedural errors.

J. Safety System Response:

Not applicable - there were no safety system responses and none were necessary.

K. Failed Component Information:

Not applicable - no component failures were involved.

II. ASSESSMENT OF THE SAFETY CONSEQUENCES AND IMPLICATIONS OF THIS EVENT:

The PVNGS Fire Protection Program assures that safe shutdown can be achieved and maintained in the event of a fire. To assure that safe shutdown conditions can be achieved and maintained for a fire in the Control Room, procedures are in place and fire protection features are designed to use selected Train "B" components for safe shutdown activities.

The control circuits for one of the two available Train "B" Essential AHU's are located inside the Control Room. If there was a fire in the Control Room, it is assumed these circuits would be damaged. The damage would render one of the two Essential AHUs inoperable. As a result of this AHU being inoperable, an engineering calculation has determined that the Train "B" inverters' and battery chargers' reliability could not be assured. Based on conservative calculations, the affected equipment could overheat in as little as six minutes with the doors closed. The Train "B" inverters and battery chargers supply power to the four independent channels of Class 1E vital instrumentation, and control loads in the Reactor Protection System (RPS)(JA) and the Engineered Safety Features Actuation System (ESFAS). Without this safe shutdown equipment, the ability to achieve and maintain safe shutdown may be adversely affected.

III. CORRECTIVE ACTION:

A. Immediate:

1. An hourly fire watch has been established in the affected area of the Control Room to ensure that any fire is identified and suppressed before the fire becomes a significant threat.



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TEXT

2. In each unit an open door permit was established to maintain and ensure that the doors between the "B" and "D" DC equipment rooms and the Train "B" ESF switchgear room are propped open to prevent overheating of the equipment rooms. Air flow from the Train "B" ESF switchgear room in the "B" and "D" DC equipment rooms will provide some cooling for the equipment rooms.

3. The procedure, "Shutdown Outside the Control Room Due to Fire and/or Smoke" is being revised. This revision will include the following changes.

- a. Within 15 hours, disconnect the control circuits for the affected Essential AHU to enable the AHU to be returned to service.
- b. Start the affected AHU by bypassing the Control Room circuit with a jumper.

These actions are expected to be completed by November 30, 1991.

B. Action to Prevent Recurrence:

- 1. A plant change request has been submitted to provide a transfer switch to isolate the Control Room circuits and a local control switch for the affected Essential AHU.
- 2. A plant change request has been submitted to provide hold open devices which trip closed on a fire for the doors between the "B" and "D" DC equipment rooms and the Train "B" ESF switchgear room.

The proposed modifications will be evaluated in accordance with the PVNGS plant change process at the scheduled Plant Modification Committee meeting in February, 1992. The implementation of the modifications will be scheduled in accordance with PVNGS Long Range Planning.

Prior to the discovery of the event postulated in this LER, APS Engineering initiated an Appendix R Revalidation Project which consists of an in-depth review of the existing safe shutdown analysis. The project involves validating the existing shutdown logic, verifying that the appropriate components are on the safe shutdown equipment list, verifying safe shutdown component circuits, reviewing spurious actuation concerns, verifying separation compliance, verifying access/egress paths for operator actions (which includes verification of adequate manpower), making design basis document changes, and initiating plant changes where



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TEXT

necessary. This is a full scope revalidation effort which is expected to be completed by the end of 1992. The revalidation effort will identify if other situations exist where errors were made in original assumptions.

IV. PREVIOUS SIMILAR EVENTS:

A previous similar event was reported pursuant to Technical Specification 6.9.3 in LER 528/91-008-01. LER 528/91-008-01 addressed a postulated fire in the Control Room affecting reactor coolant pump (RCP)(AB) seal integrity and excessive reactor coolant system (AB) leakage. The corrective actions addressed maintaining RCP seal flow and would not affect the Essential AHUs.



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